CLAIMS

What is claimed is:

1. A light source apparatus, comprising:

at least a first reflecting device having a first optical axis;

at least a first arc lamp having an arc positioned on the first optical axis, the arc producing first light rays that impinge on the first reflecting device at a first range of reflection angles measured between the optical axis and a point on the reflecting device where the first light rays impinge; and

at least a first aspherical corrector plate positioned to receive the first light rays, with the first aspherical corrector plate being shaped to effectuate a substantially constant magnification of the first arc image in at least a portion of the first range of reflection angles.

2. The apparatus of claim 1, in which the first reflecting device includes a selected one of a free-form reflector, an ellipsoid reflector, and a paraboloid reflector.

3. The apparatus of claim 1, further comprising a light integrator having first and second lenslet arrays, the first lenslet array receiving the first light rays from the first corrector plate and casting a substantially constant area arc image of the first arc lamp on each lenslet of the second lenslet array.

4. The apparatus of claim 1, further comprising:

said first reflecting device comprising a diverging reflector;

a second reflecting device comprising a converging reflector having a second optical axis;

a second arc lamp having an arc positioned on a second optical axis, the arc producing second light rays that impinge on the converging reflector at a second range of reflection angles measured between the second optical axis and a point on the converging reflector where the second light rays impinge; and

a second aspherical corrector plate positioned to receive the second light rays, with the second aspherical corrector plate being shaped to effectuate a substantially constant magnification of the second arc image in at least a portion of the second range of reflection angles.

5. The apparatus of claim 4, further including a mirror that combines the first and second light rays and emits output light rays.

6. The apparatus of claim 5, further comprising a light integrator having first and second lenslet arrays, the first lenslet array receiving the output light rays and casting a substantially constant area arc image of the first and second arc lamps on each lenslet of the second lenslet array.

7. The apparatus of claim 4, in which the first light rays exiting the first aspherical corrector plate have a decreased intensity as the first range of reflection angles approaches zero degrees and in which the second light rays exiting the second aspherical corrector plate have an increased intensity as the second range of reflection angles approaches zero degrees.

8. The apparatus of claim 1, further comprising:

a second reflecting device, including a selected one of a Strobel and dual paraboloid reflector, having a second optical axis;

a second arc lamp having an arc positioned on the second optical axis, the second arc producing second light rays; and

a lens positioned to direct the second light rays toward the first light rays.

9. The apparatus of claim 1, further comprising:

a light emitting diode (LED) array producing second light rays propagating along a second optical axis; and

a lens positioned to direct the second light rays toward the first light rays.

10. The apparatus of claim 9, in which the LED array produces red light rays.

11. A method for providing illumination, comprising:

generating first light rays from a first arc lamp having a first arc;

reflecting first light rays with at least a first reflecting device having a first optical axis, the first reflecting device being positioned such that the first arc is on the first optical axis, the light rays impinging on the first reflecting device at a first range of reflection angles measured between the optical axis and a point on the first reflecting device where the first light rays impinge; and

positioning a first aspherical corrector plate to receive the first light rays, the first aspherical corrector plate providing a substantially constant magnification of the first arc image in at least a portion of the first range of reflection angles.

12. The method of claim 11, in which reflecting with at least a first reflecting device comprises reflecting the light rays employing a selected one of a free-form reflector, an ellipsoid reflector, and a paraboloid reflector.

13. The method of claim 11, further comprising:

positioning a light integrator having first and second lenslet arrays, such that the first lenslet array receives the first light rays from the first aspherical corrector plate and casts a substantially constant area arc image of the first arc lamp on each lenslet of the second lenslet array.

14. The method of claim 11, further comprising:

generating second light rays from a second arc lamp having a second arc;

reflecting said second light rays with at least a second reflecting device having a second optical axis, the second reflecting device being positioned such that the second arc is on the second optical axis, the second light rays impinging on the second reflecting device at a second range of reflection angles measured between the second optical axis and a point on the second reflecting device where the second light rays impinge; and

positioning a second aspherical corrector plate to receive the second light rays, the second aspherical corrector plate providing a substantially constant magnification of the second arc image in at least a portion of the second range of reflection angles.

15. The method of claim 14, further comprising:

positioning a mirror to combine first and second light rays from the first and second aspherical corrector plates into output light rays.

16. The method of claim 14, in which the first light rays exiting the first aspherical corrector plate have a decreased intensity as the first range of reflection angles approaches zero degrees and in which the second light rays exiting the second aspherical corrector plate have an increased intensity as the second range of reflection angles approaches zero degrees.

17. The method of claim 11, further comprising:

generating second light rays from a second arc lamp;

reflecting second light rays with second reflecting device towards the first light rays; and

said second reflecting device being a selected one of a Strobel and dual paraboloid reflector.

18. The method of claim 11, further comprising:

generating second light rays from a light emitting diode (LED) array; and

positioning LED array such that second light rays intersect first light rays.

19. The method of claim 18, in which the LED array produces red light rays.

20. The method of claim 15, further comprising:

positioning a light integrator having first and second lenslet arrays, such that the first lenslet array receives output light rays and casts a substantially constant area arc image of the first and second arc lamps on the second lenslet array.

21. A projection system comprising:

an illumination system comprising

at least a first reflecting device having a first optical axis;

a first arc lamp having an arc positioned on the first optical axis, the arc producing first light rays that impinge on the first reflecting device at a first range of reflection angles measured between the optical axis and a point on the first reflecting device where the first light rays impinge; and

a first aspherical corrector plate positioned to receive the first light rays, with the first aspherical corrector plate being shaped to effectuate a substantially constant magnification of the first arc image in at least a portion of the first range of reflection angles;

a reflective light valve optical arrangement optically coupled to illumination system; and

a projection lens optically coupled to reflective light valve optical arrangement.

22. The projection system of claim 21, in which the reflective light valve optical arrangement comprises liquid crystal on silicon (LCOS) light valves.

23. The projection system of claim 21 in which the illumination system further comprises a light integrator optically coupled to first aspherical corrector plate.

24. The projection system of claim 21, in which the illumination system further comprises:

first reflecting device comprising a diverging reflector;

a second reflecting device comprising a converging reflector having a second optical axis;

a second arc lamp having an arc positioned on a second optical axis, the second arc producing second light rays that impinge on the converging reflector at a second range of reflection angles measured between the second optical axis and a point on the converging reflector where the second light rays impinge; and

a second aspherical corrector plate positioned to receive the second light rays, with second aspherical corrector plate shaped to effectuate a substantially constant magnification of the second arc image in at least a portion of the second range of reflection angles.

25. A system comprising:

a video unit with an output video signal; and

a projection system, coupled to video unit, to receive video signal and project video, said projection system comprising

an illumination system comprising

at least a first reflecting device having a first optical axis;

a first arc lamp having an arc positioned on the first optical axis, the arc producing first light rays that impinge on the first reflecting device at a first range of reflection angles measured between the optical axis and a point on the first reflecting device where the first light rays impinge; and

a first aspherical corrector plate positioned to receive the first light rays, with the first aspherical corrector plate shaped to effectuate a substantially constant magnification of the first arc image in at least a portion of the first range of reflection angles;

a reflective light valve optical arrangement optically coupled to illumination system; and

a projection lens optically coupled to reflective light valve optical arrangement.

26. The system of claim 25 in which illumination system further comprises first reflecting device comprising a diverging reflector;

a second reflecting device comprising a converging reflector having a second optical axis;

a second arc lamp having an arc positioned on a second optical axis, the arc producing second light rays that impinge on the converging reflector at a second range of reflection angles measured between the second optical axis and a point on the converging reflector where the second light rays impinge; and a second aspherical corrector plate positioned to receive the second light rays, with the second aspherical corrector plate shaped to effectuate a substantially constant magnification of the second arc image in at least a portion of the second range of reflection angles.

27. The system of claim 26, in which the video unit is a selected one of a DVD, video camera, and set-top box.

28. The system of claim 26, in which the reflective light valve optical arrangement comprises at least a first liquid crystal on silicon (LCOS) light valve.